

## Space-SDR: An FPGA-Based Software Defined Radio, Phase I

Completed Technology Project (2005 - 2005)



## Project Introduction

The purpose of the proposed effort is to provide a novel and innovative reconfigurable software defined radio (SDR) development system that supports the design and implementation of SDRs for human Moon/planetary surface exploration and deep space missions. This type of revolutionary technology provides significant assistance to the SDR designer, enabling the development of a wide class of radio systems and supports customization at any level within the radio architecture. The proposed development system is ideally suited for design and implementation of ultra simplified and efficient forms of SDR. The focus of this proposal is to demonstrate the applicability and feasibility of this particular SDR development technology to space exploration through analysis, design, and implementation. Successful completion of the proposed Phase I technology effort will culminate in a demonstration of interoperability with at least one NASA communications system. In addition, it will permit a Phase II effort to produce hardware and software that can be used to demonstrate the performance and impact of the proposed technology in some on-going NASA project, through demonstrating interoperability with at least two NASA communications systems.

## Anticipated Benefits

Software Defined Radio is rapidly growing in popularity and, consequentially, new application domains regularly emerge for SDR in the commercial and government marketplace. Of particular interest to StarVision Technologies is the integration of the foundational Space-SDR technologies into its line of small form factor HDTV cameras. Other areas of immediate interest and benefit to the Space-SDR team include wireless sensors, low or battery powered devices, and patient monitoring systems. Reconfigurable software defined radios have a wide applicability to NASA systems. This is especially apparent with the development of high-capacity FPGA devices that can tolerate the radiation environments of space. Specific applications of interest include: - embedded wireless communication systems for low data rate (e.g., sensor measurements) as well as high bandwidth systems (e.g., EVA suit cameras). - dedicated space-to-space communication links, especially in support of Lunar and planetary missions



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission  
Directorate (STMD)

### Lead Center / Facility:

Johnson Space Center (JSC)

### Responsible Program:

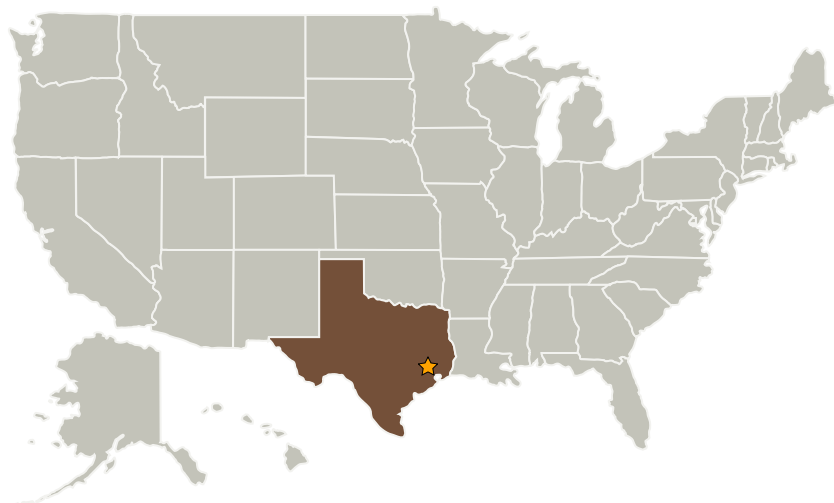
Small Business Innovation  
Research/Small Business Tech  
Transfer

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## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role                    | Type        | Location               |
|-------------------------------|-------------------------|-------------|------------------------|
| ★ Johnson Space Center(JSC)   | Lead Organization       | NASA Center | Houston, Texas         |
| StarVision Technologies, Inc. | Supporting Organization | Industry    | College Station, Texas |

## Primary U.S. Work Locations

Texas

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Project Managers:**

Mark A Chavez

Glenn A Delgado

**Principal Investigators:**

Lance S Statler

Michael Jacox

## Technology Areas

**Primary:**

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.2 Extravehicular Activity Systems
    - └ TX06.2.3 Informatics and Decision Support Systems